

10/560507

IAP6 Rec'd PCT/PTO 13 DEC 2005

VO-746

WO 2004/111472  
PCT/EP2004/005536

Table

The invention relates to a piece of furniture, such as a table, chair or stand or the like, having a support structure, which supports a receiving unit and is supported on legs or at least by one support and has hollow receivers, axially accessible from its side, which are at least partially in cross section, for an end section of the leg or the support.

In accordance with USP 4, 011,821, in connection with such a piece of furniture, in particular a table, the upper end sections of the legs are inserted into cylindrical receivers and are in this way fixed in place on the support structure in the form of a frame of linear and transverse profiled sections. Although, as a result of the separate attachable legs, such tables can be stored in small packaging units and transported, the attachment of the legs is not easy; in particular in case of large clamping forces, or not solid in case of low insertion forces.

The object of the invention is based on making available a piece of furniture of the type mentioned at the outset, in connection with which the leg(s) or support(s) can be dependably and solidly attached with as small as possible an outlay and with simple manipulation.

This object is attained by means of the characteristics of claim 1.

It is provided here that engagement elements in the form of helical segments are formed in the receivers on a respectively at least partially encircling inside, and counter-engagement elements are formed on the respective outside of the end sections, which work together with the former for fixing

the legs in place free of play, or that in the opposite way the engagement elements in the form of spirals are formed at the end sections and the counter-engagement elements in the receivers. By means of the engagement elements in the form of helical segments and of the counter-engagement elements matched to them it is possible to attach the legs or supports dependably and solidly to the frame without additional further elements and by simple manipulation, wherein the clamping of the legs in the receivers takes place by means of a simple insertion and turning movement. Simple release by turning is also possible.

In this connection steps are advantageous for manipulation and connection wherein two engagement elements in the form of grooves are located opposite each other, offset by  $180^\circ$ , each of which has an insertion element extending in an axis-parallel direction, and wherein the engagement elements are embodied as peg-shaped protrusions matched to the grooves in order to create a fixation of the table legs in the form of a quarter-turn fastener.

In this case a particularly solid clamping is achieved in that the receiver and the end section are correspondingly embodied to be conically tapering toward the free end of the end section, for example upwardly in respect to the erected table, and are dimensioned in such a way that the end section can be introduced with play in respect to the receiver in the axial direction and can be fixed in place by subsequent rotation, while supported free of play at the conical inside.

Furthermore, those steps contribute to a solid connection and support wherein the arrangement of the engagement elements and counter-engagement elements, as well as the dimensioning of the receiver and the end section, are laid out in such a way

that, with the leg attached, the upper front side of the leg is supported on an upper inner surface of the receiver.

The steps, wherein the receivers in the form of separate inserts made of plastic or metal are fixed in place in respectively matched recesses in linear profiled elements or transverse struts of the support structure, for example in the shape of a frame, are moreover advantageous for manufacturing and a simple structure.

A simple construction is also encouraged in that the linear profiled elements and/or the transverse struts are embodied as hollow profiled elements which, for introducing the inserts, have openings on their underside which are matched to the exterior cross section of the latter. Because of this it is possible to use simple basic elements for constructing the frame.

The steps, wherein the inserts are designed in a cup shape or hat shape with an open underside, and are pressed or glued into the respective recess, or are riveted or screwed from the top of the linear profiled element or transverse strut, are also advantageous for manufacturing and assembly.

Further advantages for construction and assembly are achieved in that on their underside the inserts have a collar which, in the inserted state, rests in the manner of a flange against the respective underside of the linear profiled element or the transverse strut, and/or are provided with a snap-in groove or snap-in projection working together with a lower wall of the linear profiled element or the transverse strut.

The fact that the linear profiled elements are designed as four-edged hollow profiled sections also contributes to a simple structure.

An altogether solid table structure consists in that the axes of the receivers are aligned obliquely upward and, in respect to the table, inward.

The invention will be explained in greater detail in what follows by means of exemplary embodiments, making reference to the drawings. Shown are in:

Fig. 1, a perspective plan view of a table with leg attachment areas formed on the table frame, and

Fig. 2, an enlarged representation of a leg attachment area, partially in cross section.

As shown in Fig. 1, the piece of furniture in the form of a table has a table frame 1 with a support structure in the form of a frame 3 supported on legs 2, which is formed by linear profiled elements 4, spaced apart parallel, and transverse struts 5 connecting them, and which solidly supports a preferably rectangular table top 6 on its top, which is attached to the two linear profiled elements 4 and/or the transverse struts 5. Here, the linear profiled elements 4 are offset from a center line respectively in the direction toward the front and toward back of the table top 6, so that a solid seating of the table top 6 results. The linear profiled elements 4 are designed as closed four-edged hollow profiled sections with a rectangular or square cross section. The transverse struts 5 can also consist of profiled sections rectangular in cross section, and in the present case are designed to be relatively flat, i.e. of a relatively large width in comparison with their height, so that a relatively large surface for connection with the linear profiled elements 4 can be achieved.

As shown in Figs. 1 and 2, in the exemplary embodiment the table legs 2 are arranged in the shape of the letter A, so

that a solid overall support of the table on the floor results. For achieving the A-shaped arrangement, the vertical transverse axis of the linear profiled elements is inclined obliquely upwards and inward in relation to the center longitudinal line of the table. On their underside, the end sections of the transverse struts 5 are beveled to correspond to the obliquely extending top of the linear profiled element 4 and are attached to the top of the linear profiled element 4, wherein the top of the transverse struts 5 is approximately flush with the uppermost edge of the linear profiled element 4. The lower lying upper edge of the linear profiled element 4 is approximately flush with the underside of the transverse strut 5. For a flat support of the inclined table legs 2 on the floor, a base 2.3 is attached to their underside, whose height and inclination can be adjusted.

An essential particular feature of the present table lies in the design of the leg attachment areas, as can be seen in greater detail in Fig. 2. Receivers for the upper end sections 2.1 of the table legs, designed as separate inserts 7, have been introduced into the respective openings 4.1 on the underside of the linear profiled element 4 in the leg attachment areas. The inserts 7, for example made of strong plastic or of metal, have an inner receiver, circular in cross section, with an inside 7.1, which extends conically upwards. Two helical-section-shaped grooves located opposite each other have been formed in the inside 7 as engagement elements 7.2, which are provided with groove-shaped insertion openings 7.3 extending in the direction toward the lower edge in an axis-parallel direction, wherein the insertion openings 7.3 terminate substantially in the lower portion of the helical-section-shaped grooves 7.2. The helical-section- shaped

grooves 7.2 extend with a slight rise in respect to the horizontal position of the insert 7.

The upper end section 2.1 of the table leg 2 to be introduced into the conical inner receiver is correspondingly conically shaped like the inside 2.1 of the insert 7 and matched to it, and is provided on its outside with peg-shaped protrusions 2.2 as engagement elements 2.2. For example, the protrusions 2.2 are the free protruding ends of a bolt diametrically extending through the upper end sections 2.1. For attaching the leg 2, its upper end section 2.1 is introduced into the inner receiver, in the course of which the diametrically oppositely located protrusions are inserted into the respective insertion openings 7.3 up to the helical-section-shaped grooves 7.2, and then the leg is turned, corresponding to the helical-section-shaped grooves 7.2 into the inner receiver. The dimensioning of the upper corner section 2.1 and of the inner receiver, as well as the engagement elements 7.2 and the peg-like protrusions 2.2 have been laid out in such a way that, in the course of turning, the upper end section 2.1 is drawn into the inner receiver until it is firmly clamped with its outer circumference against the inside 7.1 of the inner receiver. The dimensioning can furthermore be laid out in such a way that in the fixed state the leg is supported with its upper front end against the inside of an upper cover wall of the insert 7, because of which the table leg 2 is additionally supported in the inserted state. No tool is required here for fixing the table leg 2 in place in the inner receiver.

On its exterior the insert 7 has the shape of a circular cylinder and is provided with a collar 7.4 on its underside which, in the inserted state, rests flange-like around the

opening 4.1 matched to the outer diameter of the cylindrical portion on the underside of the linear profiled element 4. Here the linear extension of the cylinder-shaped section has been selected to be such that the cover wall rests with its outside against the inside of the upper wall of the linear profiled element 4. In order to achieve a definite installed position of the insert 7 in respect to the linear profiled element 4 also in the direction of rotation, and to prevent the insert 7 from rotating along when fixing the leg 2 in place, the insert 4 has been attached off-center on the linear profiled element 4 in the area of its upper cover wall, for example by means of a rivet or a screw. Gluing or clamping in place, or a combination of these fastening steps, is also conceivable. A different shape of the outer cross section of the insert 7 is also conceivable, for example angular, or round with one flattened lateral section. However, the round design is preferred because of manufacturing and mounting advantages. Furthermore, a structure with a vertical orientation of the table legs 2 is also possible.

It is also conceivable to provide a table with only one leg with a leg fastening of the above described structure.

Similar to the way explained above by means of a table, the fixation in place of, for example legs or bases or supports of other pieces of furniture, for example carcass furniture, stands or chairs, can take place, because the flat support of the end section of the leg, base or of another support on the at least partially encircling inside of the receiver 7 results in a firm support, in particular also against transverse forces.

It is also possible to fix a leg or a support with its appropriately designed end section reversed or in addition in

a lower base section, for example designed plate-like, in which a receiver (then open at the top) of the previously described type has been cut or inserted.